

Date: Tuesday, 6/26/2007 3:15:03 PM
 User: Kim Johnston

Process Sheet

30

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : BO 105 SKIDTUBE ASSEMBLY
Job Number : 33167	
Estimate Number : 10112	
P.O. Number : <i>N/A</i>	Part Number : D105674011G
This Issue : 6/26/2007 S.O. No. : <i>N/A</i>	Drawing Number : D2966 REV A2
Prsht Rev. : NC	Project Number : N/A
First Issue : <i>N/A</i> Type : LANDING GEAR	Drawing Revision : A2
Previous Run : 29530	Material : <i>N/A</i>
Written By : <i>[Signature]</i>	Due Date : 7/22/2007 Qty: 1 Um: Each
Checked & Approved By : <i>[Signature]</i> 07.06.27	
Comment : Est Rev: A 04.07.07 New Issue KJ/JLM	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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Comment: DOCUMENT CONTROL

Photocopy bluefile & type labels per PPP d105-674-011G CHG002

2.0	D2962125	3.540 Outer Tube, Extrud
-----	----------	--------------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number Description Batch

1 D2962-125 Extrusion

*B17532**fm 07-07-03 @*

3.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
-----	----------------	-------------------------



Comment: LANDING GEAR RESOURCE 1

1-Determine square end of tube and deburr

fm 07-07-03 @

2-Drill #30 pilot holes using DT8678. Open holes to Ø5/16" (0.313"). Deburr holes.

fm 07-07-03 @

4.0	BENDING	BENDING MACHINE
-----	---------	-----------------



Comment: BENDING MACHINE

Bend tube as per program BO105 on CNC Bender and Dwg D2966. Use 5/16" locator pin on buggy "A".

EL 070703

5.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
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Comment: LANDING GEAR RESOURCE 1

1-Cut Fwd end of the tube using DT8185-1G

EL 7-7-3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 33167

Part Number: D105674011G

Job Number:



Seq. #:

Machine Or Operation:

Description :

2-Cut Aft end at 107.06" using DT8185D *Pr 07-07-04*

3-Deburr ends *Pr 07-07-04*

4-Drill Aft Cap holes using DT8678 *Pr 07-07-04*

5-Locate DT8679 with 1/8 clecos in Aft Cap holes. Ensure DT8679 is centered on Fwd end of tube and drill #40 Fwd bushing. *Pr 07-07-04*

6-Clamp DT8679 to the tube. Drill all #30 wearplate and crossbolt holes. *Pr 07-07-04*

7-Open Aft Cap holes using #6 drill *Pr 07-07-04*

8-Open wearplate holes and two side holes to Ø19/64" (0.297") as per Dwg

D2966-1.

9-Deburr holes. *Pr 07-07-04*

10-Open remaining (16) crossbolt holes to Ø0.500

6.0

D2964

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D2964

Cap

A/R

Aluminum Rod

214101
17104221

BE 07-07-05

BE 07-07-05

7.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Weld Fwd Cap as per Dwg D2966 and QSI 004. Fill #40 Fwd cleco hole.

2-Grind Fwd Cap welds flush

8.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

W/O:		WORK ORDER CHANGES					
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Job Number: 33167

Part Number: D105674011G

Job Number:



Seq. #: Machine Or Operation:

Description :

10.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



pm 07-07-08



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

11.0 QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

BE 07-07-05 (1)

12.0 LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Open crossbolt holes to finish size as per Dwg D2966

pm 07-07-05 (1)

2-Open 14 holes to Ø0.750" & 2 holes to Ø0.875", countersink crossbolt holes & remove alodine to prepare for welding as per Dwg D2966

pm 07-07-05 (1)

3-Deburr holes inside & outside, blow out chips

pm 07-07-05 (1)

13.0 D2976

BO 105 Skidtube I Beam



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Numbe Description Batch

1 D2976 Web *B27742*

pm 07-07-05 (1)

14.0 D2971

Cross Bolt Spacer



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number Description Batch

1 D2971 Crossbolt Spacer

B33221 BE 07-07-07

15.0 D2973

Cross Bolt Spacer



Comment: Qty.: 7.0000 Each(s)/Unit Total: 7.0000 Each(s)

Pick:

Qty Part Number Description Batch

7 D2973 Crossbolt Spacer

B14636 BE 07-07-09

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Job Number: 33167

Part Number: D105674011G

Job Number: •



Seq. #:

Machine Or Operation:

Description :

16.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Bond Web in place per QSI 015. (Ensure holes line up)

Pick:

Qty Part Numbe Description Batch

A/R Sikaflex-291 M 104732

Sikaflex expiry date : 08-01-09

Pm 07-07-05 (1)

2-Weld Crossbolt Spacers as per Dwg D2966 and QSI 004. For crossbolt spacer, weld one side, pass 5/8" drill; weld other side, pass 5/8" drill.

Pick:

Qty Part Number Description Batch

A/R Aluminum Rod

M 104305 BE 07-07-09

3-Pass Ø0.630" drill to remove spillover for D2973 crossbolt. Pass Ø0.750" drill to remove spillover for D2971 crossbolt.

BE 07-07-09

4-Grind welds flush as per Dwg D2966

Pm 07-07-09 (1)

17.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

Don/07/09

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

En 07-07-09 (1)

19.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Powder Coat Grey Sandtex (Ref: 4.3.5.6) as per QSI 005 4.3

Pressure wash

M 104846

BR/FR

07-07-10

FL 07/07/10 (1)

(1)

20.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

QA

07-07-10

(2)

21.0

D2965

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Job Number: 33167

Part Number: D105674011G

Job Number:



Seq. #:

Machine Or Operation:

Description :

1 D2965

Cap

B28959

22.0

D29701

Wearplate



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 - D2970-1

Wearplate

B14589

23.0

D29703

Wearplate



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 - D2970-3

Wearplate

B12322

24.0

D31761

Bushing



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D3176-1

Bushing

B 33222

25.0

D31763

Nut



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D3176-3

Nut

B 33223

26.0

ALS71032130

Insert



Comment: Qty.: 36.0000 Each(s)/Unit Total : 36.0000 Each(s)

Pick:

Qty Part Number

Description Batch

36 ALS7-1032-130

Insert

m 103618

or ALS4-1032-130

or AKS7-1032-130

or AKS4-1032-130

FL 07/07/110

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 33167

Part Number: D105674011G

Job Number:



Seq. #:

Machine Or Operation:

Description:

27.0

AN960JD10L

Washer



Comment: Qty.: 28.0000 Each(s)/Unit Total: 28.0000 Each(s)

Pick:

Qty Part Number

Description Batch

28 AN960JD10L

Washer

m103641

28.0

MS27039108

Screw



Comment: Qty.: 26.0000 Each(s)/Unit Total: 26.0000 Each(s)

Pick:

Qty Part Number

Description Batch

26 MS27039-1-08

Screw

m104118

29.0

MS27039109

Screw



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part Number

Description Batch

2 MS27039-1-09

Screw

m18057

FL 07/02/11 (1)

30.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Inspect for foreign objects as per QSI 024

2-Install Inserts, Wearplate and Cap per Dwg D2966. Insert a drop of sikaflex at insert holes before installing wearplates. Seal Aft Cap using Sikaflex. Install bushing and nut. By looking Fwd, install nut to right hand side.

Pick:

Qty Part Number Description Batch

A/R Sikaflex-291

m104733

Sikaflex expiry date:

07/09

3-Wing Walk as per Dwg D2966 and QSI 005 4.4

Batch:

m104733

FL

07/07/12 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Job Number: 33167

Part Number: D105674011G

Job Number:



Seq. #:

Machine Or Operation:

Description :

31.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

Johnston

32.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

EN 07/07/12 (X)

33.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick: Packing Kit

34.0

D2972

Bushing



Comment: Qty.: 6.0000 Each(s)/Unit Total : 6.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

6 D2972 Bushing

B14103

35.0

D2974

Packer



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

1 D2974 Packer

B29439

36.0

D2975

Wearplate



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

2 D2975 Wearplate

B20829

37.0

AN451A

Bolt



Comment: Qty.: 3.0000 Each(s)/Unit Total : 3.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

3 AN4-51A Bolt

M103684

EP 07/07/12

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: ☒ Date: 07/07/13

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 33167

Part Number: D105674011G

Job Number:



Seq. #:

Machine Or Operation:

Description :

38.0

AN960JD10L

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

8 AN960JD10L Washer

M103044

39.0

MS21042L4

Nut



Comment: Qty.: 3.0000 Each(s)/Unit Total : 3.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

3 MS21042L4 Nut

M102552

40.0

MS27039108

Screw



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

8 MS27039-1-08 Screw

M102630

Boz 6/12/07

41.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

Boz 6/12/07

42.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D105-674-011G

Location: A

Boz 6/12/07

43.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Boz 6/12/07

Job Completion



u 6/26/07

33167

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN RF	DRAWN BY RF	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED #	APPROVED #	DRAWING NO. D2966	REV. A SHEET 1 OF 2
DATE 00.03.08		TITLE BO 105 SKIDTUBE ASSEMBLY	SCALE NTS
A	00.03.08	NEW ISSUE	

RELEASED
00.05.11 #

Qty	Part Number	Description
X	D2966-041	SKIDTUBE ASSEMBLY
1	D2962-125	EXTRUSION
1	D2964	CAP
1	D2965	CAP
1	D2970-1	WEARPLATE
1	D2970-3	WEARPLATE
1	D2971	CROSS BOLT SPACER
7	D2973	CROSS BOLT SPACER
1	D2976	WEB
36	ALS7-1032-130 or ALS4-1032-130 or AKS7-1032-130 or AKS4-1032-130	INSERT
28	AN960JD10L	WASHER
26	MS27039-1-08	SCREW
2	MS27039-1-09	SCREW
1	D3176-1	BUSHING
1	D3176-3	NUT



GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) WELDING TO BE DONE PER DART QSI 004.
- 3) INSERT D2976 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/-291 ADHESIVE PER DART QSI 015 AFTER BENDING.
- 4) USE DART DRILL TEMPLATE DT8451 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION B-B (34 PLACES) AFTER FINISH. SEAL WEARPLATE SCREWS WITH SIKAFLEX-241/-291.
- 5) DO NOT INSTALL MS27039-1-08 SCREWS AND AN960JD10L WASHERS IN THESE LOCATIONS.
- 6) INSTALL ALS7-1032-130 INSERT, MS27039-1-08 SCREW, AND AN960JD10L WASHER IN 2 PLACES THIS LOCATION BEFORE POWDER COATING.
- 7) FINISH:

ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2976 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.4) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED TO 1.00 ABOVE CENTER LINE PER DART
QSI 005 4.4 (OPTIONAL) BLACK SANDTEX (REF 4.3.5.7)

01.01.24
IP 01.01.30



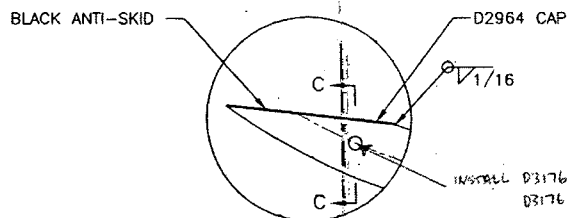
SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 33167

A2	02.10.30	ADD D3176-1/-3
A1	01.01.24	CHANGE COLOR TO BLACK SANDTEX

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DETAIL A
SCALE 1:3



SECTION B-B
SCALE 1:6

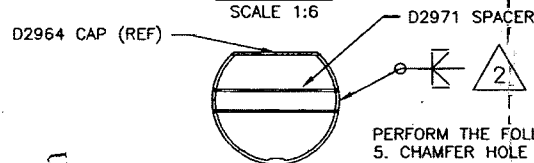


ALS7-1032-130 INSERT (34 PLACES)

MS27039-1-08 SCREW (1)
AN960JD10L WASHER (1)
(26 PLACES)

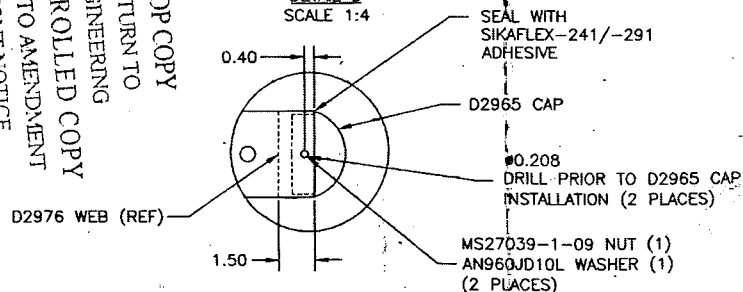
AFTER BENDING AND DRILLING ASSEMBLY
PERFORM THE FOLLOWING FOR $\phi 0.750$ HOLES ONLY:
1. CHAMFER HOLE $0.030 \times 45^\circ$
2. INSERT D2973 SPACER (7 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. PASS $\phi 0.630$ DRILL TO REMOVE SPILL OVER

SECTION C-C
SCALE 1:6

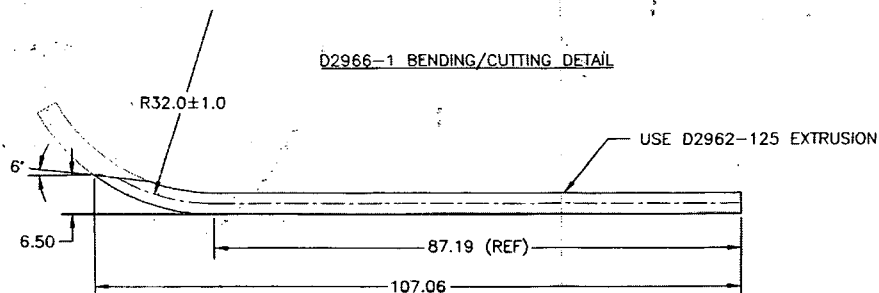


PERFORM THE FOLLOWING FOR $\phi 0.625$ HOLES ONLY:
5. CHAMFER HOLE $0.030 \times 45^\circ$
6. INSERT D2971 SPACER
7. WELD INTO PLACE AND GRIND FLUSH
8. PASS $\phi 0.484$ DRILL TO REMOVE SPILL OVER

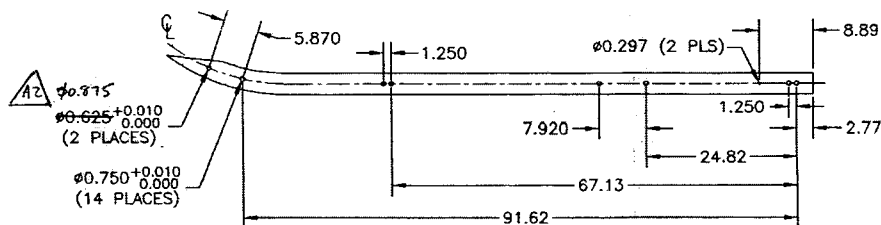
DETAIL D
SCALE 1:4



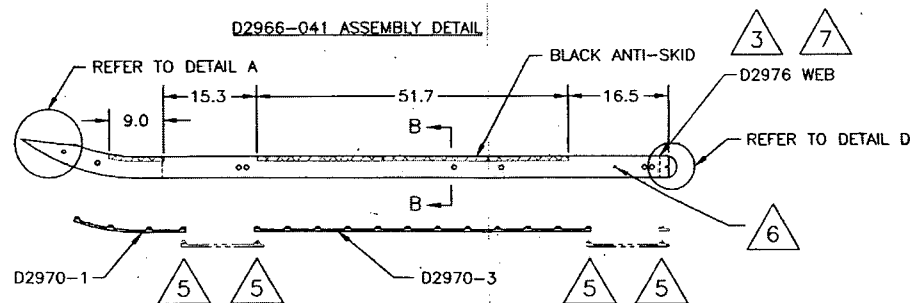
D2966-1 BENDING/CUTTING DETAIL



D2966-1 DRILLING DETAIL



D2966-041 ASSEMBLY DETAIL



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DART AEROSPACE USA, INC.

DESIGN RF	DRAWN BY RF	DART DART AEROSPACE USA, INC. BELLINGHAM, WA
CHECKED 4	APPROVED 4	DRAWING NO. D2966
DATE 00.03.08	TITLE BO 105 SKIDTUBE ASSEMBLY	REV. A SHEET 2 OF 2 SCALE 1:20

NO. 33167
WORK ORDER
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
ENGINEERING
RETURN TO
SHOP COPY

RELEASED
00-05-11

NO. 116

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name Barclay Elliott
Joint Welding Procedure Tig
Part number and Job number A105674011 G/B33168

TEST WELDS REQUIRED

BASE METAL Alum WELDING PROCESS Tig
Penetration Complete ☐ Partial ☒ Single Weld ☒ Double Weld ☐
Current AC ☒ DC ☐ Backing YES ☐ NO ☒

	Position	Vertical	Down <input type="checkbox"/>	Up <input type="checkbox"/>
Sheet Groove	1G <input type="checkbox"/>	2G <input type="checkbox"/>	3G <input type="checkbox"/>	4G <input type="checkbox"/>
Tube Groove	1G <input type="checkbox"/>	2G <input type="checkbox"/>	5G <input type="checkbox"/>	6G <input type="checkbox"/>
Sheet Fillet	1F <input type="checkbox"/>	2F <input type="checkbox"/>	3F <input type="checkbox"/>	4F <input type="checkbox"/>
Tube Fillet	1F <input type="checkbox"/>	2F <input type="checkbox"/>	4F <input type="checkbox"/>	5F <input type="checkbox"/>

Crossbolt Spacer Welded into Skidtube

TEST RESULTS

Visual Pass ☒ Fail ☐
Penetration Pass ☒ Fail ☐
Crossbolt Spacer Pass ☒ Fail ☐

The above named individual is qualified in accordance with AWS D17.1.2001 to weld

Date of Test Coupon 07/07/09 Qualifier Amid Auel